

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Number : 10/735,714 Confirmation No.: 3454
Applicant : Venkatesan SHANMUGAM
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Title : SYSTEM AND METHOD FOR GENERATING PET-CT IMAGES
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Examiner: : Andrae S. ALLISON
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REQUEST FOR PRE-APPEAL BRIEF CONFERENCE

Pursuant to the Pre-Appeal Brief Conference Pilot Program announced in the Official Gazette, Applicants hereby request a pre-appeal brief conference in the above-referenced case. No amendments are being filed with this request. Additionally, this request is being filed with a Notice of Appeal.

This application is appropriate for a pre-appeal brief conference. A brief history of this application and why applicants believe that an appeal will succeed are set forth below.

This application was filed more than four years ago on December 16, 2003. On February 8, 2007, an initial action was issued rejecting claims 1-20 using U.S. Patent No. 6,490,476 to Townsend et al. ("Townsend") in view of U.S. Patent Pub. No. 2003/0190065 to Hamill et al. ("Hamill") under section 103. On May 8, 2007, Applicants timely filed a response to the Office Action and successfully argued that Townsend and Hamill fail to teach each and every claimed limitation. On July 23, 2007, a second Non-Final Office Action was issued rejecting claims 1-7, 9-17, and 19-20 using the three-reference combination of Townsend, U.S. Patent Pub. No. 2003/0161521 to Newport et al. ("Newport"), and Hamill and rejecting claims 8 and 18 using the four-reference combination of Townsend, Newport, Hamill, and U.S. Patent No. 6,272,469 to Koritzinsky et al. ("Koritzinsky") under section 103. On October 17, 2007, Applicants timely filed a response to the second Non-Final Office Action and argued that the combinations fail to teach each and every claimed limitation. On January 7, 2008, rather than withdrawing the improper

rejections and allowing the claims, the Office issued a Final Office Action and maintained the same rejections using the same references even though the combinations fail to teach all the claimed limitations.

Regarding claim 1, for example, the Office acknowledges that Townsend does not disclose all the method steps as recited. In particular, the following step is admittedly not taught by Townsend:

*“(d) simultaneously conducting the following steps:
reconstructing at least a portion of a PET image for the current
frame, including the step of overlapping a portion of the
current frame with an adjacent frame, and
acquiring at least a portion of a next frame of PET data.”*

It is respectfully submitted that none of the Newport, Hamill, and Koritzinsky references cure the deficiencies of Townsend.

For example, in claim 1, method step (d) requires that “*at least a portion of a next frame of PET data*” be acquired at the same time when “*at least a portion of a PET image for the current frame*” is being reconstructed. The Examiner cites paragraphs [0015]-[0016] and the Abstract of Newport as allegedly disclosing this limitation. Specifically, the Office states that Newport’s “parallel architecture is used to acquire and reconstruct PET images [such that] both processes are performed simultaneously.” See Office Action at p. 5. However, neither the excerpt relied upon by the Examiner nor the reference as a whole teaches that the processes of *acquiring* and *reconstructing* PET images are performed simultaneously. In fact, nowhere in Newport is “simultaneous” reconstruction and acquisition of data even disclosed.

Rather, Newport specifically states that “data from the acquisition process 102 is output, asynchronously, to the histogram process 104” and it is the histogram process that “outputs synchronous data as two data streams 162, 156” as shown in Fig. 1. See Newport at [0035], [0037] (emphasis added). In other words, the parallel architecture of Newport refers to the simultaneous or synchronous processing of the two data streams 162, 156 not the *acquisition* of data and image *reconstruction*. In fact, Newport clearly depicts this parallel architecture in Fig. 1, which is reproduced below for convenience.

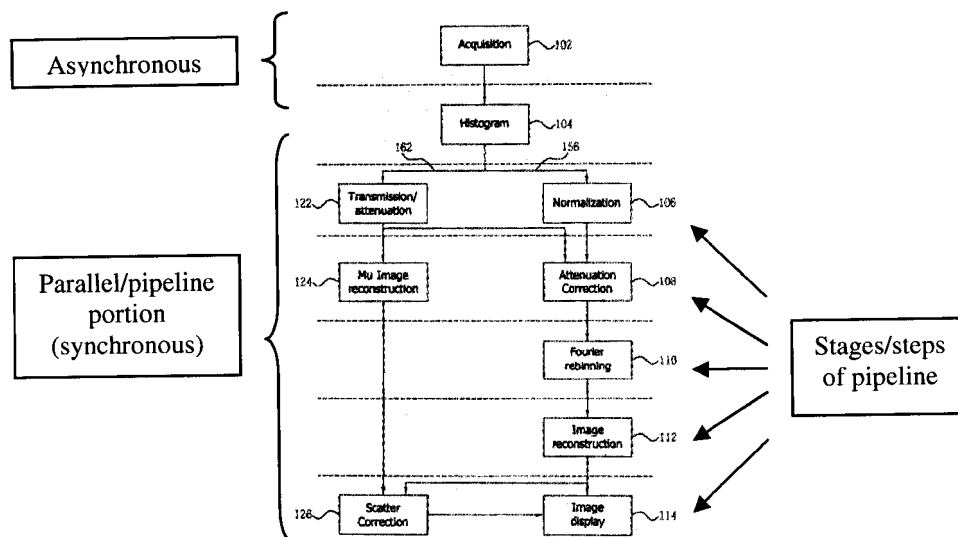


Fig. 1

Thus, in Newport, “[a]s the patient bed crosses predetermined positions, specific portions of the acquired data are inserted into the processing pipeline. At each stage of the pipeline, a different processing step is performed on the data in parallel to the others. The final result of the pipeline is a single reconstructed image plane corresponding to the acquired data inserted in the pipeline at an earlier time.” See Newport at [0015] (emphasis added). Once an image is reconstructed, “the patient bed moves [and] new image planes are continually produced in a periodic fashion.” See Newport at [0015]. In other words, after one image of a specific portion is reconstructed, the patient bed moves to another portion to and the process of Fig. 1 is perform for a new portion. This is clearly distinguishable from the recitation of claim 1, which requires simultaneous “reconstructing at least a portion of a PET image for the current frame” and “acquiring at least a portion of a next frame of PET data.”

Furthermore, Newport fails to specifically teach “reconstructing at least a portion of a PET image for the current frame, *including the step of overlapping a portion of the current frame with an adjacent frame*,” as expressly recited in the claim. For example, once Newport’s patient bed shifts a predetermined amount, histogramming is likewise shifted and the 3D sinogram space is no longer within the histogramming region and is no longer within the axial field-of-view of the tomograph.

Hamill also does not cure the deficiencies of Townsend or Newport. For example, the Examiner relies on paragraph [0080] of Hamill for allegedly teaching “overlapping a portion of the current frame with an adjacent frame.” See Office Action at p. 5. However, Hamill does not teach or even mention overlapping a portion of the *current frame* with an *adjacent frame*. Rather,

Hamill merely recites a “33 cm overlap between the two *bed* positions” (emphasis added). This is clearly distinguishable from the recitation of claim 1, which requires “*overlapping a portion of the current frame with an adjacent frame.*” Furthermore, Hamill fails to teach simultaneous “reconstructing at least a portion of a PET image for the current frame” and “acquiring at least a portion of a next frame of PET data.” Therefore, like Newport, the additional timing requirement for the two sub-steps (e.g., simultaneous “reconstructing” and “acquiring”) in step (d) is also not taught in Hamill.

Koritzinsky also does not cure the deficiencies of Townsend, Newport, or Hamill as discussed above. For example, the Office relies on column 1, lines 5-7 of Koritzinsky for allegedly teaching a “method for executing protocol.” However, Koritzinsky does not teach or even mention the additional timing requirement for the two sub-steps (e.g., simultaneous “reconstructing” and “acquiring”) in step (d). Thus, it should be appreciated that none of Koritzinsky, Newport, and Hamill fail to cure the deficiencies of Townsend because the references also do not teach at least simultaneous PET image reconstruction overlapping a portion of the current frame with an adjacent frame and PET data acquisition as presently claimed.

Even assuming, for the sake of argument, that Townsend, Newport, Hamill, and Koritzinsky teach all of the limitations set forth above, the Office Action does not present a proper rationale to combine the references to achieve the claimed system and method, and thus has failed to set forth a *prima facie* case of obviousness. For example, Applicants respectfully submit that the allegation that one of ordinary skill in the art would have modified Townsend by the teaching of Newport, Hamill, and Koritzinsky to “reduc[e] the reconstruction time for the PET data” is not proper reasoning of obviousness to support the combination of reference teachings the Office urges. *See, e.g.,* Office Action at p. 5.

First, Applicants respectfully submit that the Office improperly *assumes* the combination recited in the claim would be desired. For example, the Office Action asserts that the combination “can [be] processed or operated on at the same time” (emphasis added). *See, e.g.,* Office Action at p. 5. The PTO has the burden to establish that the prior art taken as a whole suggests the desire or advantage. Here, the Office Action simply assumes (not the references as whole) that it would have been obvious to one of ordinary skill in the art to create a continuous tomography bed in Townsend’s combined PET/CT system. Furthermore, the assertion that a secondary reference

“can” be processed or operated on at the same time does not constitute an adequate explanation to conclude an obvious combination.

Second, Applicants submits that the Office’s assertion of obviousness is lacking in *evidence*. Instead, the Office Action improperly relies on his own hindsight conjecture or improperly gleans from the specification that the feature of simultaneously reconstructing at least a portion of a PET image for the current frame and acquiring at least a portion of a next frame of PET data provides a “reducing the reconstruction time for the PET data.” See, e.g., Office Action at page 5. For example, the Office’s statement that Newport, Hamill, and Koritzinsky would provide such a feature to Townsend’s specific method and system is wholly unsupported. In fact, such reasons for obviousness cited by the Office Action to combine the references is nowhere to be found in any of the references. Even assuming that the reason for obviousness is applicable, Townsend makes no suggestion that it would benefit from the teachings of Newport’s continuous tomography bed, Hamill’s iterative linogram reconstruction feature, or Koritzinsky’s protocol handling feature. Therefore, the person of ordinary skill would not combine teachings from these disparate references to arrive at Applicants’ invention. As a result, the Office’s conclusion is clearly based on improper hindsight reasoning and fails to set forth a *prima facie* case of obviousness.

Thus, an appeal on these bases will certainly succeed, but the time and expense in preparing an appeal brief on that issue should not be borne by GE Healthcare when the grounds are so clearly improper.

Respectfully submitted,



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